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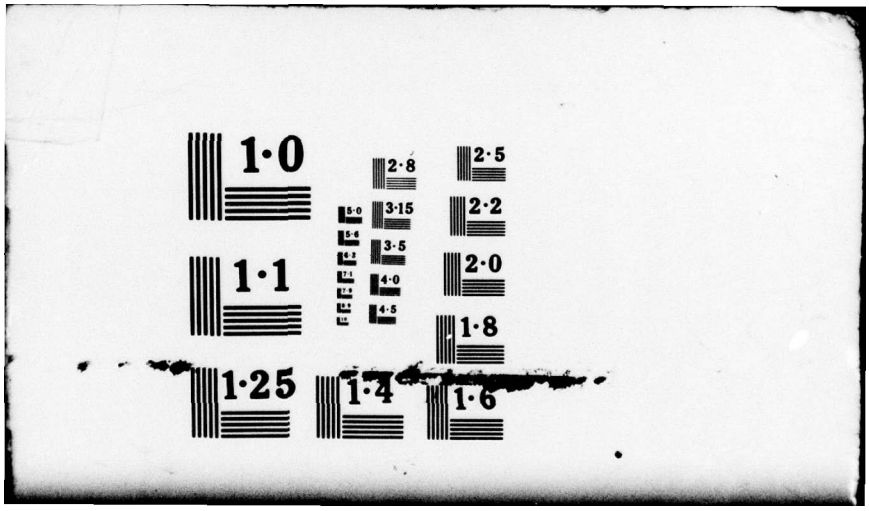
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THERAPEUTIC EFFICACY OF HOMOLOGOUS ANTIBOTULIMS PLASMA

[Article by I. N. Piven', Prof. T. V. Golosova, A. V. Sidorova. Bacteriology Laboratory (Head--Prof. T. V. Golosova), Central Institute of Hematology and Blood Transfusion (Dir. Cor. Member of the USSR Academy of Medical Sciences O. K. Gavrilov) and Department of Infectious Diseases (Head-Prof. V. N. Nikiforov), Central Institute of Advanced Training for Physicians (Rector--M. D. Kovrigina), Moscow. Moscow PROBLEMS OF HEMATOLOGY AND BLOOD TRANSFUSION, in Russian, No 20 (?), 1975, pp 46-49, submitted to the Editorial Board 26 July 1974]

An effective method of treating a number of infections with specific immunoglobulins isolated from convalescent or immunized donors is finding widespread application in a number of countries. The availability of such preparations presents doctors with the opportunity of employing the immune serum globulin which does not elicit anaphylactic reactions.

A homologous antibotulin plasma was obtained from adequately immunized donors at the Central Institute of Hematology and Blood Transfusion. A study of the effectiveness of the therapeutic application of native homologous antibotulin plasma was conducted at the Department of Infectious Diseases of the Central Institute of Advanced Training for Physicians at the Clinical Hospital imeni S. P. Botkin.

There were 49 patients under observation (25 women and 24 men). A feature of the botulism epidemiology was the link between the disease and food products canned at home: canned mushrooms--38 patients, dired fish--5 patients, smoked ham--2, lard--1, purslane--3. In the overwhelming majority

of cases the disease manifested itself in groups, and only among 5 individuals was it sporadic. All cases were recorded during the autumn and winter period.

A biological test on mice confirmed the diagnosis for 32 patients, among these type A was isolated in 12, type B in 15, and type E in 3. Toxin was found in the blood of 18 patients, and isolated from the food products in 14 cases. In addition the diagnosis for 17 patients was established on the basis of clinical and epidemiological data.

The clinical picture of botulism was identified in 3 stages: initial, climax, and the period of the recovery development of neurological symptomatology. The rate of development, degree of expression and abundance of mioneurological symptomatology reached the maximum during severe forms of botulism. In fact all patients in this group exhibited a distinct ophthalmoplegic syndrome, speech impediment and difficulty in breathing. The latter was observed in 9 patients.

Patients suffering from botulism underwent comprehensive treatment. Cardiovascular and neurotropic substances and preparations for nonspecific disintoxication were used. Primary significance was imparted to the specific serotherapy which was employed in all instances regardless of the date of onset of botulism with the presence of clinical symptoms.

Of 49 patients, 16 were treated with native homologous antibotulin plasma. The disease occurred in a mild form in 8 patients, moderately severe in 5, and severe in 3.

The antibotulin plasma was injected 1-2 times a day intravenously in 250 ml doses from 3-5 times. Throughout the treatment the patients received antitoxins type A from 2,000 to 10,750 mass units, type B from 1,000 to 5,250

mass units, and type E from 1,500 to 10,250 mass units. Therapeutic effect was normally noted during the first 24 hour period of treatment and manifested itself in improved state of health, vision, and swallowing. By the end of the 2-3 days ptosis was reduced, the scope of movement of the eyeballs increased, conve gence improved, and the soft palate showed improved lability. As a result of treatment with homologous antibotulin plasma all of the patients recovered.

A study of the dynamics of passive immunity among patients following one-time intravenous injection of the homologous preparation demonstrated that the antitoxin titre in a protective concentration (not less than 0.01 ME/ml) was detected for 3 days with the injection to the patient of not less than 5 ME/kg of immune plasma.

We cite this example as an illustration.

Patient A., aged 37, arrived 5/1/1971 complaining of dizziness, headaches, poor vision, difficult in breathing and parched throat. She had fallen ill on 27/12/70 four hours after eating home canned mushrooms when a heaviness appeared in the epigastric area followed by vomiting. On the following day vision deteriorated and parched throat appeared. When she arrived she was in a stage of average heaviness, with expressed intoxication and was weak. The reaction of the pupils to light was weak and convergence was disturbed. Bacteriological testing of the blood yielded botulin toxin type B. On the first day she received intravenously a native homologous antibotulin plasma with action of antitoxins of type A 5875 ME, type B 1250 ME, and type E 3000 ME. By the following day after initiation of serum therapy the patient improved; the headache and weakness disappeared, vision and swallowing

improved. The patient received 2 more injections (on the second and third days) of 250 ml of homologous antibotulin plasma containing for type A, 875 and 500 ME, type B, 250 and 125 ME, for type E 500 and 250 ME. By the third day of treatment swallowing was fully restored, vision improved significantly with a slight weakness and dryness of the mucous membranes remaining. Vision was fully restored by the 12th day.

The case cited is of interest because the patient following a brief (4 hour) period developed a picture of botulism with a characteristic mio-neurological syndrome. Despite the delayed initiation of specific therapy, following injection of even 1250 ME of homologous antitoxin we noted in the clinic a reverse development of symptomatology. Throughout the period of Treatment we injected 1625 ME of the same antitoxin, and on the 12th day the function of the oculomotor nerves had been restored damage to which was the reason forcing the patient to seek medical help.

In certain instances homologous antibotulin plasma was transfused following injection of equine serum, when despite therapy with heterogennic antitoxin the patients did not show signs of improvement. The introduction of homologous antitoxin in such cases led to the elimination of intoxication.

Let us cite an example.

Patient K., 47 years old, in the hospital from 15/X to 23/XII/1972 suffering from botulism type B of a bulbar form, severe course and acute respiratory insufficiency. He was brought to the hospital in a moderately serious condition on the 2nd day of illness arising from the consumption of home canned mushrooms. Upon arrival he complained about parched throat, difficulty in speaking and swallowing, double vision and weakness. Objectively; ptosis of the eyelids, nearly total lack of movement of the eyeballs,

convergence and accomodation are absent, pupils are extended and do not react to light, the soft palate is not moving, the patient does not swallow, speech is disarthric. The patient was given equine antibotulin serum types A, C and E of 120,000 ME, type b 60,000 ME which was injected twice a day during the first 3 days. However, the condition of the patient deteriorated progressively; intoxication increased. Respiratory problems appeared in connection with which the patient was moved to the resuscitation unit for pulmonary ventilation. On the fifth day of his stay at the hospital the patient began treatment with homologous antibotulin plasma type A in a 1,000 ME dose, types b and E in doses of 750 ME, 250 ml for three days in a row, once a day. Against the background of treatment with the specific plasma the eye problems disappeared quickly and swallowing improved. The patient was released on the 67th day.

In the control group (33 individuals) at the same time treatment was continued using equine antibotulin serum injected intramuscularly and only in some cases intravenously. Before injecting the serum it was necessary to establish individual sensitivity to heterogenous protein. Treatment with the specific preparation was begun against the background of desensibilizing therapy: as a rule calcium gluconate, dimedrol, pinolphen and under certain circumstances prednizolon in a 30-90 mg dose daily. Despite the meticulous maintenance of these rules 11 (33%) patients showed expressed serum reaction.

We cite an observation.

Patient L., 25 years old, was admitted on 9/IX/1972 on the third day of illness complaining of poor eyesight, a "fog" before his eyes, weakness and parched throat. He became ill 7 days after eating a piece of smoked

ham. Objectively: his condition was moderately serious, pupils extended, convergence disturbed, movement of eyeballs restricted. Treatment conducted with antibotulin serum type A, E, C of 35,000 ME and type B of 20,000 ME. On the 7th day of treatment all groups of the lymphatic nodes grew. On the 8th day followed a collapse accompanied by loss of consciousness, and a drop in arterial pressure to 0. Massive desensibilizing therapy and heart medication provided the necessary effect and the patient recovered.

With the positive effect of serum therapy the symptoms of botulism stopped to expand and this was followed by their gradual reverse development the pace and time of which were closely linked to the nature of the symptoms, the gravity of the illness and individual reaction of the patient. All patients were released in satisfactory condition.

Thus, clinical approbation of the homologous antibotulin plasma showed that the preparation possessing therapeutic effectivenes is reacted to well by patients. There was no need for intracutaneous testing for sensitivity to heterogenous protein. The advantage of the homologous preparation injected intravenously is linked to the rapid development in blood of optimal concentrations of antibodies which circulate over a prolonged period of time in the blood, as well as with the more expressed stimulating effect on factors of nonspecific immunity. This led to the rapid reverse development of pathological symptomatology. Moreover, serum complications were avoided during the injection of homologous antitoxin.

Clinical application of homologous antibotulin plasma confirmed its medical value which provides the basis for reccomending this preparation for the treatment of patients suffering from botulism.

# THERAPEUTIC EFFICACY OF HOMOLOGOUS ANTIBOTULIN PLASMA

*I. N. Piven, T. V. Golovina, A. V. Sidorova*

The authors present the results of first clinical trial of a homologous antibotulin plasma. The preparation was obtained at the Central Institute of Hematology and Blood Transfusion from adequately immunized donors and approbated at the Chair of Infectious Diseases of the Central Medical Postgraduate Institute. There were 49 patients with botulism under observation (1970—1972); 15 of these were treated with homologous plasma of directed action, and 33—with heterogenic serum.

The advantage of homologous antibotulin plasma injected intravenously proved to be associated with a rapid creation in the blood of the optimal antibody concentrations; these antibodies circulated in the blood for a long time; there was also a more marked stimulating effect on the nonspecific immunity factors which led to a rapid regress of pathological symptoms. Intradermal test for sensitivity to heterogenic protein was unnecessary before administration of the plasma under trial, this being of importance taking the time factor in the treatment of botulism into consideration. Besides, serum complications were excluded after injections of a homologous antitoxin.